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CENTRAL INTELLIGENCE AGENCY

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COUNTRY USSR

REPORT

SUBJECT

1. Lenin Plant for the Repair of River Vessels in Astrakhan
2. Thermal Power Plants in Magnitogorsk and Zhmerinka

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SOURCE EVALUATIONS ARE DEFINITIVE. APPRAISAL OF CONTENT IS TENTATIVE.

Attachment 1: Lenin Plant for the Repair of River Vessels in Astrakhan. A detailed report on the facilities and organization of the plant which employed about 800 persons and repaired river tugs engaged in the transport of oil and fishing vessels of the Caspian Sea Fishing Fleet. [redacted] future plans called for the enlargement of the plant to permit the construction of "engines and oil tankers," and a sketch attached to the report shows the projected plant modifications. Incidental mention is made of the falsification of production figures in 1954 and the subsequent prosecution of plant authorities.

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Attachment 2: Thermal Power Plants in Magnitogorsk and Zhmerinka (N49-02 E 28-06). A general report furnishing limited information on the capacity and physical installations of the Magnitogorsk thermal power plant. The turbine section of the plant was equipped by 1954 with three turbines each with a capacity of 50,000

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kilowatts, and construction of two more turbines was planned. Included is a sketch on which 15 installations at the plant are located.

the thermal plant at Zhmerinka is superficially described. The power of its four steam turbines was reportedly 900,250, 500, and 500 kilowatt-hours, respectively. A sketch of this plant is not included.

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FIELD INFORMATION REPORT

COUNTRY: **USSR (Chelyabinsk Oblast/Vinnitsa Oblast)** PORT N

SUBJECT: **Thermal Power Plants in Magnitogorsk
and Zhmerinka**
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Thermal Power Plant in Magnitogorsk

1. The Magnitogorsk thermal power plant (teplovaya elektro tsentral-TETs) had no numerical designation. It was on the right bank of the Ural River about 400 meters from the Magnitogorsk metallurgical combine. Its construction begun in 1952 was dedicated to the XIX Congress of the CP.
2. Fuel consumption per kilowatt was 0.5 to 0.52 kilograms of coal.
[redacted] the installed capacity had a 100 percent output. The production of kilowatt-hours was 50,000 during the day reduced to 35,000 to 40,000 during the early morning hours. The plant worked every day of the year, although production was considerably reduced on Sundays and holidays. It supplied steam to part of the city industry, [redacted] not know the quantity or steam pressure.

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3. The turbine and boiler house (No. 1 on sketch of plant), a 120m x 90m brick structure with an iron roof frame, was divided into two sections separated by a wall. The turbine section was 20 meters high and the boiler section 25 meters high. 25X1
4. The boiler section (No. 6 b) had two boilers by 1954 and it was planned to install at least two more. The boilers were square. [redacted] Next to the building was a coalbin with a square brick tower, inside or near which were two mills, one of which ground the coal, while the other pulverized it. The powdered coal was transferred by conveyor belt to the boilers. [redacted] Powerful cranes moved on rails to the coalbin and the tower unloading railroad cars, and loading the mills. 25X1
5. The turbine section (No. 6 a) was equipped with three turbines with a capacity of 50,000 kilowatts each by 1954. The turbines had the trademark VK-50 (~~высокого давления~~ kondensatsiya- high pressure condensation-50,000 kilowatts). Their construction, in the Leningrad Metal Plant (Leningradskiy Metalicheskiy Zavod imeni Stalina - LMZ), was dedicated to the XIX Congress of the Soviet CP. Construction of two more was planned. Connected to the turbines were three alternating current generators, constructed in the Leningrad Kirov Plant. Installation of two more was planned. This machinery was installed on the first floor. In the basement were six turbo-pumps, each with about 1,000 hp, which worked alternately, three at a time, in connection with the electric motors of the motor pump section, which supplied water for the boilers, for cooling the condensers, and for all the equipment which needed water. In case of breakdown of the generating equipment, the turbo-pumps were used as extra units to power the electric motor pumps so that the supply of water for the boilers and for cooling continued on a provisional basis. This section was equipped with one 100-MT crane and two 30-MT cranes on rails for the assembly, dismounting, and repair of machinery.
6. Control house (No. 4), a 50m x 40m brick and cement building, ten meters high. It contained all the control panels and electric control apparatus for the power plant. [redacted] 25X1
7. Substation (Nos. 12 and 13), a building 80m x 10m which contained the distributors and control panels for the transformers. Next to the building was the transformer yard. The transformers increased the voltage to more than 100,000. [redacted] They were supported by 20-meter-high metal posts of normal construction. 25X1

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8. Pump house (No. 2), a one-story 100m x 15m brick and cement building ten meters high with basement. On the main floor, there were nine electric motors, each with 1,300 hp and each with an adjoining pump. In the basement, there was a complex system of inlet and outlet pipes. The building was equipped with filters for purifying the water

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There were no water cooling towers, as the cooling process took place at the river inlet.

9. Machinery repair shop (No. 11).

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10. The turbines and generators ran at 3,000 rpm. They had a frequency of 50 cycles.

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- 11.

12. Plant organization was similar to that of other plants. There was a director, chief engineer, administrative section chief, technical section chief, laboratory chief, and repair section chief. Each production section had a chief engineer and assistant engineer. The boiler house had a machinist and an assistant for each boiler and several laborers who fired the boilers and removed the slag. In the turbine house, there were a turbine machinist who worked with an assistant on each turbine, a person in charge of generators, and several cleaning women. The control house had two technicians for each shift. In the pump house, there were five persons in charge of engines and others in charge of the control panels.

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estimated number of operators for three shifts at about 200. There were no military personnel, prisoners, or foreigners working in the plant.

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13. The only plans for additions to the plant were the installation of two more turbines and two more boilers. All building construction had been finished before 1954.

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Thermal Power Plant in Zhmerinka

14. Zhmerinka (N 49-04, E 28-06) was a district capital in Lvovskaya Oblast (sic) in the Ukrainian SSR. The thermal power plant was located very near the railroad station of Zhmerinka, which was an important railroad center. The plant worked in connection with other power plants, but it had been installed to supply power to some important railroad repair shops located about 800 meters from the plant.

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15. The power plant burned coal. [redacted] a diesel section with five or six engines and a capacity of about 4,000 kilowatt-hours; and a [redacted] section equipped with four steam turbines, one of which was of German make [redacted] The others were of [redacted] make with [redacted] The capacity of the turbines was 900, 250, 500, and 500 kilowatt-hours, respectively. [redacted]

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Legend to the Sketch of the Thermal Power Plant (TTPs) in Magnitogorsk.

1. Main entrance for personnel and vehicles.
2. Pump house.
3. Administration and main plant offices.
4. Control house.
5. Passageway four to five meters high which connected the turbine house with the control house.
6. Main building which contained the turbine house (a) and the boiler house (b).
7. Forty-meter brick chimney for the expulsion of smoke and gases from all the boilers.
8. Open-air coalbin.
9. Twenty-meter-high square tower.
10. Conveyor which transferred pulverized coal from the foot of the tower to the boilers.
11. Machine repair shop.
12. Control panels, distributors, and other substation apparatus.
13. Transformers.
14. Railroad entrance.
15. Large metallurgical combine of Magnitogorsk, located about 400 meters from the power plant. It is mentioned as a point of reference.

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Magnitogorsk Thermal Power Plant
(not to scale)

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**LENIN PLANT FOR REPAIR OF RIVER
VESSELS IN ASTRAKHAN**

1. The Lenin Plant, which was not known [] by any other name and which repaired river vessels, was subordinate to the Ministry of Petroleum Industry and the VOLGOTANKER enterprise, as were all industries related to the production or transport of oil in the Volga area. The plant was located on the right bank of the Volga River, about 300 meters from a large bridge built in 1953 and was surrounded by a wooden fence about two and one-half meters high. The city of Astrakhan (N 46-21, E 48-03) was situated on the other side of the river, about two and one-half kilometers directly west of the plant. It was planned to merge the Lenin Plant with two others, the Uritskiy Plant for the repair of river and ocean-going passenger vessels and the Dvadsatpyatyy Oktyabrskiy Zavod for the repair of fishing and merchant ships, which were located on the left bank of the Volga near Astrakhan. With this idea in mind, a project existed to modify and expand the Lenin Plant, as indicated by [] sketch on page 11. 25X1

2. The Lenin Plant, which employed about 800, repaired river tugs engaged in the transport of oil and fishing vessels of the Caspian Sea Fishing Fleet. Following is a breakdown of the types of repairs done by the plant: 25X1
 - a. Annual cleaning and checking of all vessels attached to the plant. Each year about 24 ships underwent cleaning and checking, each ship remaining at the plant from 30 to 60 days.
 - b. General inspection and repair, undertaken every three years. New piston rings, base bearings, and wrist pin bearings were usually installed and starting, intake, and exhaust valves were ground. About four ships underwent general inspection and repair annually, each ship remaining at the plant from five to six months.
 - c. Complete overhauling, which ships underwent every 18 years. The plant handled this type of work for two ships annually, each remaining about ten months.
 - d. Modernization, consisting of the replacement of all worn and antiquated parts and machinery, including auxiliary engines and prime movers. This type of work was done only under orders from the Ministry. No yearly schedule existed for the modernization of ships, as many as three or four years going by without such work being undertaken.
 - e. Emergency repairs, received by an average of three ships a year.

3. The following raw materials were delivered to the plant by ship or truck [] 25X1
 - a. Fuel oil, brought by ship from Baku (N 40-23, E 49-55).
 - b. Paints.
 - c. Steel in sheets, rods, and ingots.

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- d. Iron ingots for the foundry.
 - e. Bronze in bars and rods.
 - f. White metal, not further identified.
 - g. Tin, in bars.
 - h. Antifriction metal.
 - i. Engine blocks and pans for auxiliary engines and prime movers, received from an engine plant in Kolosna (N 55-05, E 38-45).
 - j. Copper and steel tubing of different sizes.
 - k. Generators, motors, accessories, cables, and electrical equipment.
 - l. Sandpaper and emery paper.
 - m. Bearings.
 - n. Steel and bronze wire.
 - o. Pine logs, towed in rafts from the north.
 - p. Screws and rivets.
 - q. Electrodes of different types.
4. Water was supplied by the city of Astrakhan. The Trusovskiy rayon sub-station supplied the plant with an adequate amount of 220-volt electricity. A 1,000 horsepower, 736-kilowatt, US-made Diesel generator partially supplied the plant's needs in emergencies. A plant sub-station was under construction in 1956.
5. Small railway cars, pulled by electric carts, provided all transport within the plant. Ships, trains, and four or five three-metric-ton trucks provided outside transport. Only fuel and lumber were delivered by ship. The plant had wide, asphalt roads, open to traffic in all weather.
6. The plant worked one seven-hour shift five days a week and four hours on Saturdays. Vacations were granted throughout the year although most workers took theirs in summer because winter was the busy season. Engineers and office workers received 20 working days off a year; laborers received 15 working days. The average salary for workmen was 1,000 rubles monthly after deductions. Privileges and recognition were granted for superior work. [] never [] complaints or strikes, and absenteeism at the plant was practically non-existent. Sanitary conditions were good. Shops were well ventilated, had showers, and were fumigated once a year.
7. About 15 guards, both men and women, armed with old rifles, kept a 24-hour watch at all plant entrances. They were not members of any official police force but were subordinate to the plant's personnel office. Dogs were used at night to guard the wall surrounding the plant. Workers were required to present the usual propusk in order to enter or leave the plant; access was free to all buildings within the plant area. A small fire-fighting group had one well-equipped fire engine; each shop had fire hoses, extinguishers, and personnel trained in fire fighting.

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8. The majority of the 800 employees were specialists. No non-Soviets or prisoners were employed. On page 9 is a chart showing the plant's table of organization. Following is a description of the functions of some of the plant's principal sections and offices.
- a. Chief engineer, responsible for all the plant's technical work and for solving the most important problems in the various shops. Keeping closely abreast of production and repairs, he directed the fulfillment of work norms through the shop chiefs.
 - b. Personnel Section, in charge of the hiring and firing of all plant personnel, of the training of specialists on-the-job, and of maintaining dossiers on all employees.
 - c. Finance Section, completely responsible for the plant's finances. This section did not handle any money except the payroll. Thus it did not receive payment for the repair work done by the plant but sent periodic statements to the main offices of VOLGOTANKER.
 - d. Chief of Orders and Warehouses, responsible for all plant warehouses. He obtained from other plants all necessary raw materials and equipment.
 - e. Head machinist who was in charge of a group of machinists who repaired machine tools, air or steam pipes, and maintained the plant heating system.
 - f. Technical office, consisting of (1) the construction bureau which planned the modification or modernization of ships and established norms for the repair or reconstruction of worn parts, and (2) the technicological section which established the work processes for the plant.
 - g. Work-safety technician who inspected tools, shops, and work processes. He fined negligent employees and filed a report on second offenders.
 - h. Planning, Production, and Organization Section. Primarily, this section was responsible for planning and distributing plant work to individual shop chiefs. It kept an account of the time and materials used for particular jobs, proposed changes in work norms, and applied them as outlined by the New Norms Verification Committee.
 - i. Technical control chief who was primarily concerned with the checking machine components and mechanisms produced or repaired at the plant. He was in direct touch with the Ministry which appointed him to the plant as inspector and he did not have to go through the director. The technical control chief had two or three assistant foremen in each plant production shop.
 - j. Work coordinator who organized and coordinated the different phases of the work among the various shops so that there were no stoppages or delays.
 - k. Floating dry dock dispatcher who scheduled the work on vessels at the plant's floating dry dock and assigned the groups of laborers according to specific shop requests made the preceding day.
 - l. Shop chiefs, each of whom was responsible for the administration and operation of his shop.
9. The Repair Shop had the following organization:
- a. A shop chief, who was an engineer.

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- b. An assistant, who was a machine technician. 25X1
- c. A foreman, first class, for the Copper Boiler Shop.
- d. A foreman, second class, for the Copper Boiler Shop, who was in charge of a group of about 40 tube fitters.
- e. Fitting foremen, each in charge of three or four ten-men brigades of tube fitters.
- f. An operations office including a work organizer, an accountant in charge of recording the percentage of fulfillment of work norms, two draftsmen, and a time-studies specialist.
- g. Two inspectors who accepted or rejected work.
- h. A shop laborer, who represented the labor unions.
- i. A Party secretary.
- j. A Komsomol secretary.
10. Following is a description of the plant's buildings and installations and their functions. The numbers in parentheses refer to the numbers on the sketch on page 10.
- (1) First-aid station, in a 6 X 10 meter one-story building, which offered the services of a physician and a health officer.
- (2) Cabinet-making and carpentry shop, a 20 x 150 meter one-story brick building, the interior of which was wood-paneled for insulation purposes. Steel columns were placed at intervals along the interior walls to support the steel framework of the roof. The south half of the roof consisted of a large skylight; the floor and the other half of the roof were wooden. This shop built and repaired ships' furnishings, made models for castings, and took care of the plant carpentry work. The shop was equipped with two band saws, a circular saw, two large lathes, various small lathes, and other machinery. About 50 persons worked one shift. 25X1
- (2a) Approximate location of an electric power substation for this shop, being built in 1956.
- (3) Sawmill and Lumber Storage.
- a. Sawmill, containing a circular saw, two machines that automatically cut planks to the same width and thickness, and drying machines. Lumber was received in the form of squared logs hauled in small railroad cars from the sawmill indicated as point No. (26). Finished lumber went to open air storage until required by the cabinet-making and carpentry shop (No. 2).
- b. An open lumber storage area measuring 130 x 200 meters and surrounded by a wooden fence.
- (4) Asphalt highway which went north to Astrakhan, and south to an unspecified point.
- (5) Garden in the center of an asphalted area near the main door.
- (6) Single-track, non-electrified railroad, which connected with the Astrakhan-Grozny line.

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- (7) Secondary warehouse which was subordinate to the main warehouse (see No. (20) on sketch) and dealt directly with the workshops. It was located in a barracks-type log-framework structure, measuring 10 X 50 X 3 meters, whose ceiling and floor were made of wooden planks. This warehouse contained finished and semi-finished cast parts, which were withdrawn from the warehouse for shipboard installation; most repairs were done in winter because of the decrease in shipping activity during that season. Only one person worked at this warehouse.
- (8) A one-story reinforced-concrete building measuring 30 X 120 X 10 meters with engaged columns supporting a steel-frame monitor roof covered with uralite. This building housed the following shops:
- a. Tempering shop, equipped with two large electric furnaces, a small electric furnace, two fuel-oil furnaces, and a small electrolytic depositor for pitted or worn parts. Small railroad cars transported the parts between this shop and the machine shop (No. 9 below). Two tempering specialists and two helpers worked here. Articles were chrome-plated in this shop. The tempering shop was adequate for the plant's needs. 25X1
 - b. Forge shop, equipped with drop hammers of the following capacities: 1 ten-metric-ton, 2 five-metric-ton, 2 three-metric-ton, and 1 one-metric-ton. There were also three fuel-oil furnaces. Products from the forge were sent to the secondary warehouse and to the machine shop. About 35 employees on a single shift worked here on forged parts, crankshafts, stamped-out pieces, and non-precision cutting tools. 25X1
 - c. Boiler room, supplying the plant with compressed air, steam, and heat; it also made seltzer water for the workers.
- (9) Machine shop. All ship repair parts made in the plant were machined here. There were two large furnaces about 15 meters long, three milling machines, a gear-cutter, three horizontal, one vertical, and one bridge planer, 50 standard lathes, a vertical lathe, a guillotine-type lathe, several grinders, a five-metric-ton crane, and a 40-metric-ton crane. Parts were received from the secondary warehouse, the forge shop, and the foundry. After machining, the parts were sent back to the secondary warehouse and to the repair shop. A total of about 200 workers worked two or three shifts as required. 25X1
- A small section (a), located in the extreme southern end of the building made tools exclusively for this machine shop. 25X1
- (10) Repair Shop that repaired prime movers, auxiliary engines, pumps, and all other ship machinery. Once repaired, machinery was transported in small cars to the secondary warehouse or sent directly for installation in vessels under repair. The repair shop had four standard lathes, a new automatic conical-valve grinding machine, and one 30-metric-ton and one 50-metric-ton crane. A powerful emergency Diesel generator was located in the southern part of this shop, (a). An average of 130 workers worked in the shop in the summer, and between 250 and 300 in the winter. This additional personnel consisted of mechanics from ships under repair. 25X1
- The repair shop and the machine shop were located in the same concrete building and were separated by a wall with connecting doors. This building measured about 50 X 160 X 12 meters and had a steel-frame monitor roof supported by reinforced-concrete columns; the roof covering was uralite.

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- (11) Foundry, a one-story building measuring 25 X 150 meters, similar in construction to that described above, but with two very wide, iron smokestacks projecting about four meters above roof level. The foundry took care of all the plant's needs, except for the engine blocks and pans, which were manufactured in other plants. The machinery in this shop consisted of two fuel-oil furnaces, a small furnace for ferrous metals, several automatic sieves, and automatic mixer for refractory earth, and two powerful fans. Castings were transported in small cars to the machine shop and to the secondary warehouse. [redacted] in the foundry there were about 70 workers working two shifts; the furnaces worked two 24-hour days a week. [redacted] 25X1
25X1
- (12) Paint Shop. A 6 X 10-meter log structure. This shop painted exteriors and interiors of repaired vessels, and shipboard machinery, such as engines and pumps. The only equipment used in this shop were paint brushes and air-brushes (paint sprayers). [redacted] 25X1
[redacted]
- (13) Copper Boiler Shop, a 10 X 20-meter one-story brick building with a sheet metal roof. The shop worked at bending and cutting copper and steel tubing to specifications and making threaded and non-threaded joints. These finished articles were used in engine and other shipboard installations. The machinery of this shop consisted of a lathe for making pipe joints and nipples, etc.; a machine for bending tubing up to 300 millimeters in diameter; a machine, invented in the plant, for the centrifugal deposit of an antifriction alloy (made of tin, copper, and antimony) on base bearings and wrist pins. About 60 persons worked a single shift, and shop products were sent to the machine shop.
- (14) Garden with benches and in the center, a bust of Lenin.
- (15) Technical Office, located in a 20 X 30-meter one-story wooden building. (See paragraph 8f. above.) This office was staffed by two chief engineers and a total of 24 construction engineering assistants and draftsmen.
- (16) Main gate for plant personnel and vehicles.
- (17) Main offices, located in a 20 X 20-meter, two-story wooden building.
- (18) A 4-meter square reinforced-concrete platform with gantry crane. There was a bench in the center of said platform upon which ship propellers were balanced and cylinder liners tested.
- (19) Railroad siding gate.
- (20) Warehouses and shops, a 200 X 25-meter, two-story concrete building with steel-frame roof. It housed the following:
- a. A general warehouse which occupied the bulk of the two stories.
 - b. A firehouse on the main floor.
 - c. An electrical shop in charge of all plant and shipboard electrical repairs and installations. It had a small winding machine, a battery charger, testing devices, etc.
 - d. A shed for the storage of tubing.
- (21) Entrance gate for small cars used in unloading ships. A bridge connected this gate with the river bank.

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- (22) A five-ton crane on rails for unloading materials, auxiliary engines, and other equipment to be repaired at the plant.
- (23) An uncovered area for welding and boiler work.
- (24) Welding and boiler shop, a 125 X 25-meter, one-story, steel-brick building. The shop repaired decks, hulls and bulkheads, and built shipways and ships auxiliary boilers. This shop had the following machinery: two punching machines, two machine shears, several manual and pneumatic riveting machines, 12 electric welding units, and two sheet-metal coilers of different sizes. Finished products were loaded directly onto the ships. Two hundred workers usually worked a single shift, although two shifts were sometimes necessary.
- (25) Entrance gate for small cars used in unloading ships. A bridge connected this gate with the river bank.
- (26) Sawmill, a 75 X 25-meter, one-story wooden building where logs were squared. The shop was equipped with a powerful circular saw, a band saw, and a hand-crane. Ten persons worked one shift.
- (27) Entrance gate for small cars used in unloading ships. A bridge connected this gate with the river bank.
- (28) Log receiving and storage area which supplied the sawmill.
- (29) A five-meter-wide conveyor belt, used for transporting logs from the river to point no. (28).
- (30) Volga River.
- (31) Steel and concrete bridge built in 1953. It was two kilometers long, and had a double-track railroad line, a road, and pedestrian walks.

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11. Constant effort was made to improve the quality and quantity of output. Monetary awards were given to engineers, foremen, and laborers responsible for increased production or economies in production. Inventors of safety or labor-saving devices were also rewarded. In 1954, production figures were falsified and the culprits were denounced to the plant authorities and prosecuted. Future plans included plant enlargement to permit the construction of engines and oil tankers. Following is the legend for the sketch on page 11, showing the projected plant enlargement and changes:

- (1) Plant boundary, as of 1956.
- (2) Planned large building to be used as a secondary warehouse.
- (3) Planned addition to buildings Nos. (9) and (10) above, which was to house the machine shop.
- (4) Planned addition to the welding and boiler shop.
- (5) Planned large building to house the repair shop.
- (6) Planned new wharf with reinforced concrete retaining wall. The wharf was to run the length of the plant and project about 2,000 meters to the northeast and about 300 meters to the southeast of the plant's existent limits. [redacted] that the plant area would be extended northeast and southeast to coincide with the wharf's dimensions.

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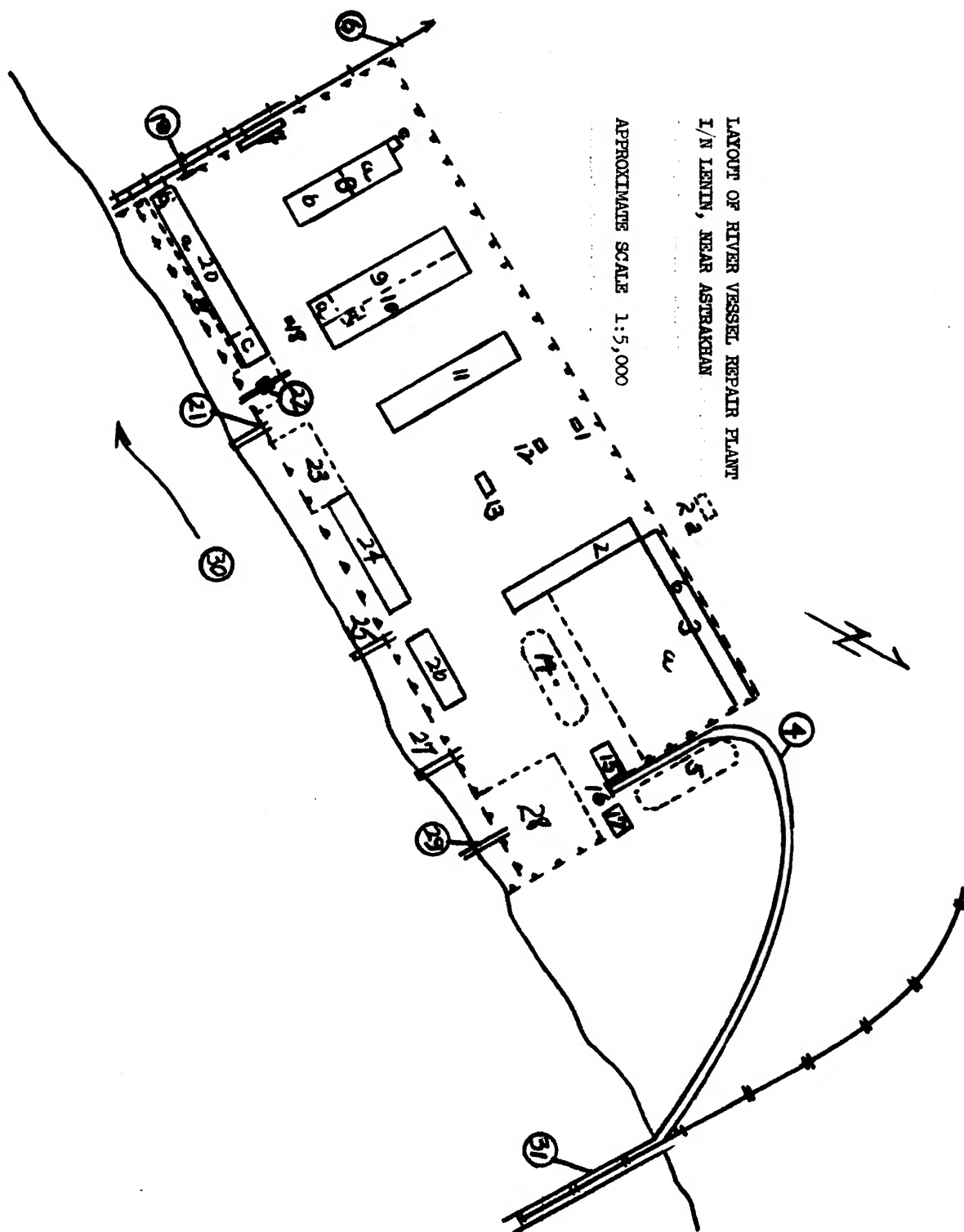
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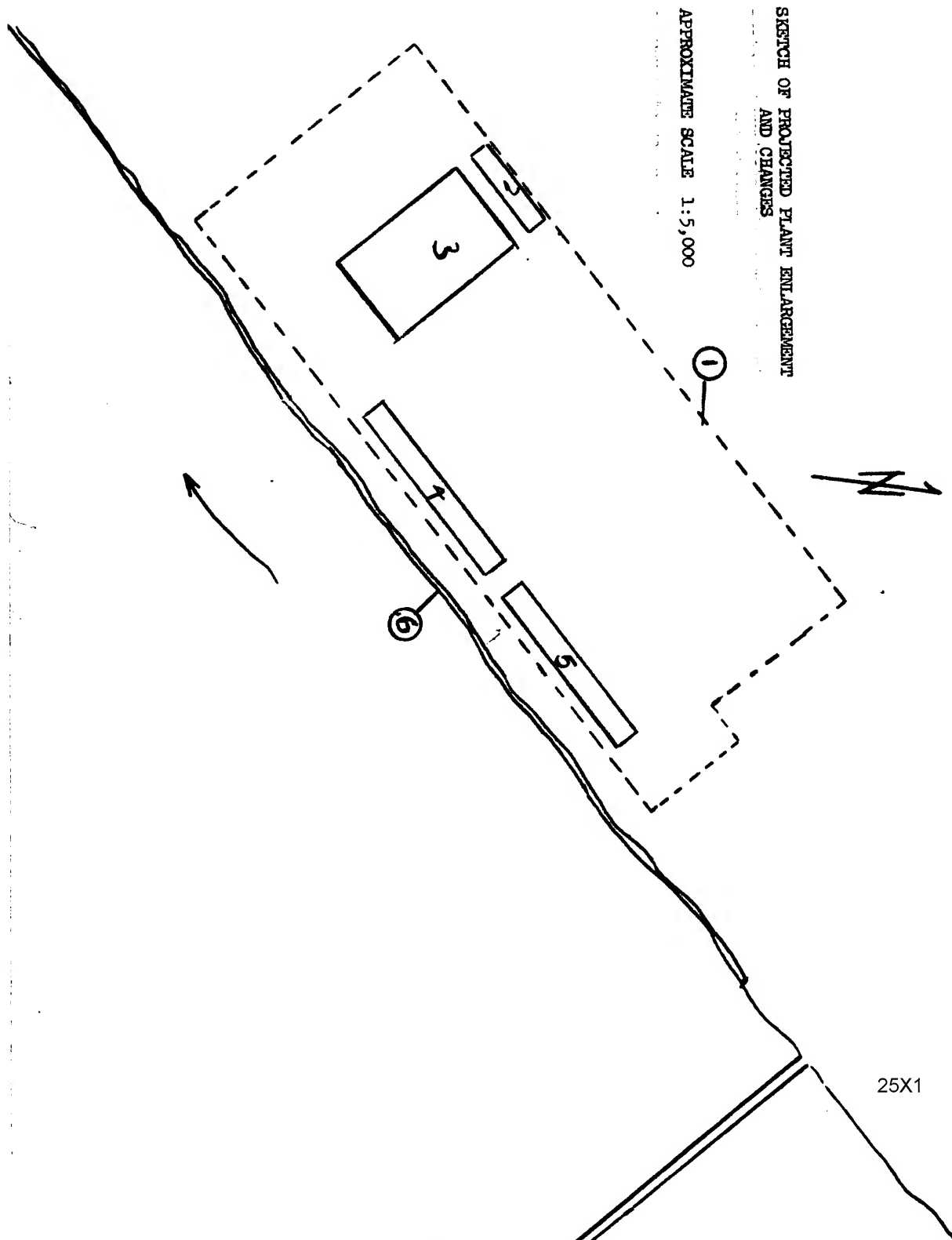
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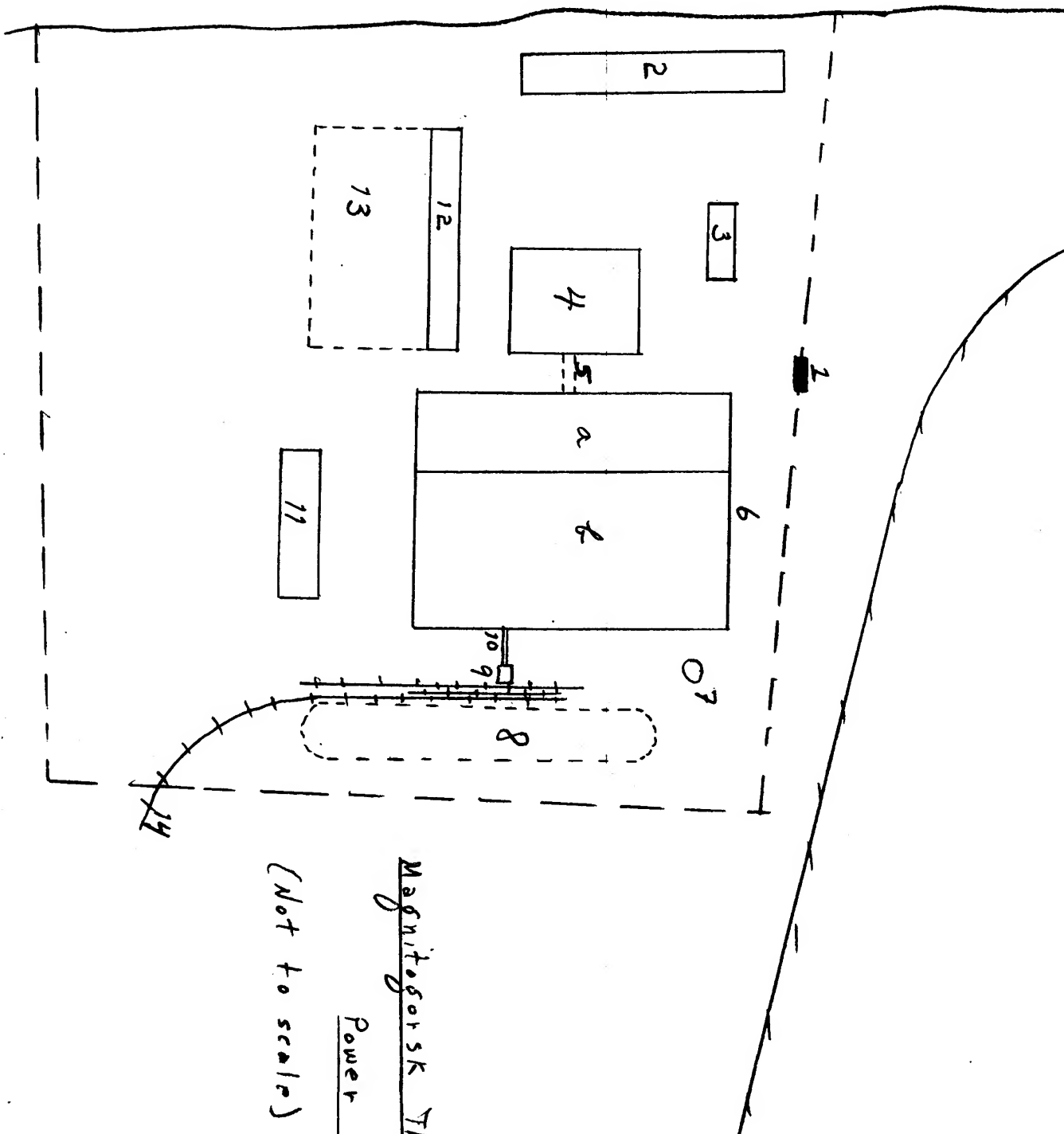
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